## ABSTRACT

The invention relates to the manufacture of molecular sieve adsorbents, which are selective towards oxygen from its gaseous mixture with argon and/or nitrogen. More particularly, this invention relates to the manufacture of molecular sieve adsorbents useful for the separation of oxygen-argon gaseous mixture. More specifically, the invention relates to the manufacture and use of a molecular sieve adsorbent by cation exchange in zeolites by rare earth cations to obtain oxygen selective adsorbent from its gaseous mixture with nitrogen and argon at ambient conditions of temperature and pressure. Thus prepared adsorbent is useful for the separation and purification of nitrogen and argon from its mixture with oxygen.